LIABILITY NOTICE

All services described in this document are provided by Energy, Mines and Resources, Canada, or its agents, on the basis that the submittor agrees to hold harmless and indemnify Canada and its ministers, officers, employees, and agents from all liability to any corporation, organization, person or other entity arising out of the provision of these services or any omission related thereto, except to the extent the liability results from wilful or wanton misconduct of Canada or its ministers, officers, employees, or agents.

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CERTIFICATION AND TESTING SERVICES FOR EQUIPMENT AND MATERIALS FOR USE IN GASEOUS MINES, NON-GASEOUS MINES, AND OTHER HAZARDOUS LOCATIONS

INTRODUCTION

In 1955 the Department of Mines and Technical Surveys, now Energy, Mines and Resources Canada (abbreviated as EMR), under Order-in Council R.C. 1958-313, initiated a certification service for electrical equipment for use in underground coal mines because of the presence of explosive mixtures of methane and air. As the demand for certification of other mining products grew, the services were expanded to include other aspects of health and safety in underground mining. Today it embraces flameproof electrical and diesel powered equipment, diesel equipment for non-gaseous mines, fire-resistant conveyor belting, fire-resistant and static-free ventilating ducts, intrinsically safe electrical equipment, combustible gas detection systems, electrical cables and cable glands, fire-resistant hydraulic fluids, certified repair facilities, and permissible blasting devices.

Parallel to the expansion of the certification service, a non-certification contract testing service grew out of the knowledge and experience gained from the certification work. This contract testing work now involves the testing of products for use in explosive atmospheres in applications such as oil processing plants, offshore oil platforms, and natural gas processing plants. This work is performed on behalf of manufacturers, other certification agencies, Provincial inspection authorities, and end users.

This document supersedes certification memoranda 1, 2, 3, and Division Report ERP/MRL 80-21(TR).

1. GENERAL INFORMATION

1.1 Organizational Structure

Throughout this document reference is made to the Department of Energy, Mines and Resources (EMR), which is a Department of the Government of Canada. The abbreviation EMR is used as a convenience, and all such references are specifically intended to represent that part of the Energy, Mines and Resources

organization which is directly associated with the provision of the services described herein. These services are provided by the Canadian Explosive Atmospheres Laboratory (CEAL), which is one of several laboratories in the Mining Research Laboratories group. The Mining Research Laboratories form a division of the branch of EMR known as the Canada Centre for Mineral and Energy Technology (CANMET).

1.2 Fees

The certification and testing services offered by EMR as described within this document are intended to be provided on a cost recovery basis, and the fees associated with these services are indicated in Appendix A.

1.3 Mailing Address

All items mailed to the Laboratory should be addressed as follows:

Energy, Mines and Resources Canada
CANMET - Mining Research Laboratories
Canadian Explosive Atmospheres Laboratory
555 Booth Street
Ottawa, Ontario
K1A 0G1
Canada

Note: The above is a mailing address only. It is not to be used for shipping purposes or for courier deliveries.

1.4 Shipping Address

Samples for inspection and testing, courier deliveries, and other non-postal shipments should be directed to:

Energy, Mines and Resources Canada
CANMET - Bells Corners Complex
Building No. 9
Haanel at Timm Drive
Nepean (Ottawa), Ontario
Canada

EMR assumes no responsibility for the transportation of samples from the Ottawa air terminal, local customs brokerage houses, or from any other location, local or otherwise, to the Laboratory. Applicants are responsible for

ensuring that samples arrive at the above address from the point of shipment. All Shipping charges, both to and from EMR, are the responsibility of the applicant.

1.5 Visitors to Laboratory

Visitors to the Laboratory for the purpose of witnessing tests or any other purpose are welcome, but prior arrangements must be made.

The Laboratory is located approximately 17 km west of downtown Ottawa in the suburb of Bells Corners (see directions to CANMET Bells Corners Complex, Appendix B).

1.6 Customs Brokers

Equipment which is to be sent to EMR for inspection and/or test from outside Canada, which will be returned to the applicant after the inspection and/or test, is not subject to Canadian duty. However, the applicant must make a declaration to Canada Customs. If acceptable, the apparatus will be admitted to Canada under a "Temporary Admission Permit", Canada Customs form no. E29B. For further information, the applicant should contact the customs broker for EMR at the following address:

Charles Higgerty Customs Brokers
2473 Sheffield Road
Ottawa, Ontario
K1B 3V6
Canada

Telephone: (613) 748-6600
Telex: 053-4142 (Answerback: HIGGERTY OTT)

1.7 Telephone, Telex and General Enquiries

General enquiries, certification enquiries or enquiries regarding the contract testing of products should be directed to the EMR Certification Officer (Mr. J.A. Bossert) at (613) 996-4570 ext. 138 or to the Head, Certification (Mr. G. Lobay) at (613) 996-4570 ext. 128. Enquiries regarding the EMR Quality Assurance program should be directed to Mr. M.S. Ralph at (613) 996 4570 ext. 127. The Laboratory telex number is 053-3586, and the answerback is M R BELCOR OTT.

Telephone enquiries concerning any of the information in this document are invited.

1.8 Confidentiality of Information

1.8.1 Access

The applicant will be required to submit documentation as specified herein. All submitted documentation is treated as "industrial confidential". No party other than the EMR Certification Officer and his designated officers shall have access to the submitted documentation except as agreed upon, in writing, by the applicant.

1.8.2 Lawful Demand

Clause 1.8.1 does not apply in cases where certification and testing documentation is required for presentation at the request of a commission of inquiry or by other lawful demand.

1.9 Amendments to Document

From time to time, EMR reserves the right to issue amendments to any part of this document, and reserves the right to issue subsequent editions of this document.

1.10 Effective Date

This document is effective upon the date of its publication.

2. CERTIFICATION SERVICES

2.1 Description of Service

2.1.1 Certification Criteria

Wherever possible, EMR evaluates products in accordance with the requirements of published Canadian Standards. Where acceptable standards do not exist, EMR uses requirements developed in-house. In all cases, the criteria used to certify products are not confidential and are available to applicants.

2.1.2 Authority of EMR

EMR has no authority to permit the use of any apparatus or material in any location. This responsibility rests with either the Provincial Mines Inspection Authorities in provincial jurisdictions, or Labour Canada in Federal jurisdictions (such as federally owned coal mines). EMR only certifies that equipment and materials comply with stated requirements; applicants should consult with the inspection authority having jurisdiction regarding specific requirements for acceptance. EMR maintains a list of Provincial and Federal Inspection Authorities which is supplied upon request.

2.1.3 Scope of Certification - Gaseous Mines

EMR certification is recommended or required by the authorities having jurisdiction, for products intended for use in gaseous underground mines, including coal mines. The reader is advised to contact the inspection authority having jurisdiction regarding specific requirements. The range of products certified is as follows: flameproof electrical equipment, intrinsically safe equipment, fire resistant and anti-static conveyor belting, flameproof diesel equipment, electrical cables and cable glands, fire-resistant and anti-static ventilation duct and materials, fire resistant hose conduits, combustible gas detection equipment, fire-resistant hydraulic fluids, certified repair facilities, miners' cap lamps and permissible blasting devices.

2.1.4 Scope of Certification - Other Than Gaseous Mines

EMR certification is also offered in the following categories: Fire-resistant conveyor belting, fire-resistant ventilation duct and materials, non-flameproof diesel equipment and fire-resistant hydraulic fluids. Other categories may be added in future.

2.1.5 Description of Certificate

2.1.5.1 Certificate

When products have been investigated by EMR and found to comply with the relevant certification requirements, a certificate will be issued to the applicant to this effect. The certificate specifies the product investigated, the basis of the certification in terms of the standard(s) or other criteria used to evaluate the product, and bears the signature of the Certification Officer.

2.1.5.2 Schedule

A schedule associated with the certificate will be issued which will list conditions of certification as applicable to the subject product, relevant details of construction and/or formulation of the certified products, and other information as deemed relevant by EMR. Construction details are documented by a set of drawings and/or product literature which fully describe the certifiable aspects of the product. Fire resistant materials are documented by a complete description of the formulations used in the manufacture of the product, but because of the highly confidential nature of these formulations, such information is not included in the schedule. Product formulations are kept in a file to which only the EMR Certification Officer has access. Changes to the certified product will be documented as a subsequent schedule issue, and will specify the changes made to the certified apparatus or material. All schedules are considered to comprise part of the certificate with which they are associated.

2.1.6 Certification Officer

The EMR Certification Officer, with the recommendation and advice of delegated officers, is solely responsible and authorized for certification of products in accordance with the services described herein. In order to be valid, all original EMR certificates must bear the signature of the EMR Certification Officer.

2.2 Applications for Certification

2.2.1 Applicant's Agreement

In making an application for certification, the applicant agrees to accept all relevant terms and conditions stated in this document. Failure to comply with these stated terms and conditions shall provide grounds to EMR for rescindment of any certificates affected by such non-compliance.

2.2.2 Application Forms

EMR provides no application forms. A letter from the applicant requesting certification is acceptable.

2.2.3 Withdrawl of Application

Applicants reserve the right to cancel and withdraw applications for certification at any time.

2.2.4 Agents

2.2.4.1 Agents - Conditions

Applications for certification shall normally be made by the manufacturer, but will be accepted from agents if the manufacturer agrees to comply with the certification requirements of EMR. It is the responsibility of the agent to advise the manufacturer of any and all terms and conditions of EMR certification as specified herein and as specified on EMR certificates granted to manufacturers' agents. It is also the responsibility of the agent to obtain the manufacturer's agreement of intention to comply with the aforesaid terms and conditions and to confirm in writing to EMR that such agreement has been made.

2.2.4.2 Change of Agent

A change of manufacturer's agent for a given certified product is acceptable to EMR; however, such changes must be reported to EMR within one month of such change being made. Non-compliance with this requirement may cause EMR to rescind the certificate.

2.2.4.3 Owners as Agents

Applications for certification from owners or users of equipment will be accepted, but certifications so granted shall only be issued under the EMR Label Service (see below). The "General" classification of certificate (see clause 2.6.1.1) will not be issued to owners or users of equipment.

2.2.5 Documentation Required

2.2.5.1 General Documentation Requirements

All drawings submitted to EMR as part of an application for certification shall be submitted in duplicate. At the conclusion of a certification investigation, all drawings will be stamped by EMR, dated, and initialled by an officer of EMR. One set of drawings is then returned to the applicant for retention and reference for the life of the certificate, with the second set being retained by EMR. In the event of dispute, the set of drawings held by

EMR shall be deemed the documentation which specifies the certified product. All drawings and documentation shall be worded in English or French.

2.2.5.2 Other Certification Agencies

If certification documentation is available as issued from another agency, an acceptable documentation package shall consist of the certification documentation issued by the certifying agency, the relevant test report, and the drawings listed in the certification documentation. Such documentation, if complete, may reduce the amount of testing and investigation required by EMR.

2.2.5.3 Flameproof Equipment - Electrical and Diesel

Note: The term "flameproof" is synonymous with "explosion proof".

Drawings depicting the flameproof construction of the apparatus shall be submitted, including all flame path dimensions. An assembly drawing of the product shall be submitted, indicating the location of the flameproof components. Detailed drawings of components not having relevance to the flameproof construction of the product, need not be submitted. Instruction manuals, as provided with the equipment shall also be submitted. A parts book shall be submitted with applications for certification of diesel engines, in addition to the engine performance curves and specifications.

2.2.5.4 Intrinsically Safe Equipment and Combustible Gas Detection Equipment

A schematic diagram, showing all component values shall be submitted, in addition to an assembly drawing of the apparatus as a whole and all printed circuit board component layouts. In some cases, the PC board artwork may also be required.

2.2.5.5 Cables and Hose Conduits

A specification sheet, indicating constructional details of the product shall be supplied.

2.2.5.6 Fire-resistant Products

This clause applies to fire-resistant conveyor belting, mine ventilation materials, and hydraulic fluids.

In all cases, a specification document shall be provided indicating physical construction details of the product (not applicable to hydraulic fluids), and detailed formulations of the materials used in the submitted product. Product formulations, due to their highly confidential nature, should only be sent directly to the attention of the EMR Certification Officer, as these are kept in a file to which only this person has access. In the case of hydraulic fluids, a separate submission (containing the same information as submitted to EMR) to the Canada Department of Health and Welfare, will be required for toxicity clearance.

2.2.5.7 Non-Flameproof Diesel Equipment

A parts book of the engine and a set of engine performance curves and specifications shall be submitted.

2.2.5.8 Miners' Cap Lamps (Non-Intrinsically Safe)

A set of drawings, depicting the construction of the apparatus shall be submitted, including an assembly drawing and details of overcurrent protection.

2.2.5.9 Certified Repair Facilities

A list shall be provided indicating details of the equipment available for use in the shop for repair of EMR certified equipment. In addition, a list of the test equipment and the key personnel with their qualifications and positions shall be submitted.

2.2.5.10 Blasting Devices

If of generally flameproof construction, the documentation requirements of clause 2.2.5.3 apply, or if of generally non-flameproof construction, the documentation requirements of clause 2.2.5.4 apply. In addition, the applicant shall supply information regarding the output cutoff criteria of the submitted apparatus.

2.2.6 Samples

2.2.6.1 Requirement for Inspection and/or Testing

In almost all cases, samples will be required during the course of an investigation leading to certification, as specified in the relevant sections herein.

Samples are required for inspection and/or testing, and for verification of compliance with the applicable EMR requirements. In all cases samples must be typical of actual production, must be in conformance with the product specification submitted to EMR as related to the subject sample(s), and any difference(s) between the foregoing samples and specifications must also be stated in writing to EMR at the time of sample submittal.

2.2.6.2 Sample Quantities

This clause is applicable to flameproof electrical, intrinsically safe, flameproof diesel, combustible gas detection and miners' cap lamp equipment. One sample is required for inspection and/or testing, as advised by EMR.

2.2.6.3 Samples - Conveyor Belting

The following samples are required for conveyor belt testing:

Size (mm) (all by full thickness)	Number of samples required Types A1 & A2	B1 & B2	C
12.5 ± 1 x 150 ± 2 (warp)	4	4	4
25 ± 1 x 100 ± 5 (weft)	10	10	10
12.5 ± 1 x 150 ± 2 (weft)	4	4	4
(all 4 edges of the above samples to have exposed carcass)			
150 ± 2 x ~1500, warp, slit edges	4	2	2
~300 x ~300, slit or finished sides	2	2	2
900 ± 10 x 4000 ± 20, slit ends, slit or finished sides	2	2	none

2.2.6.4 Samples - Electric Cables and Hose Conduits

A three metre length of the product is required.

2.2.6.5 Samples - Ventilation Materials

Two square metres of flexible ventilation material is required per type submitted. A one metre length of rigid ventilation duct is required for each type submitted.

2.2.6.6 Samples - Hydraulic Fluids

A 20 litre sample of the each fluid to be tested is required.

2.2.6.7 Samples - Range of Products

If a range of products is to be certified, the samples required for inspection and/or testing will be representative of the product range to be included in the certificate. Applicants are directed to contact EMR regarding specific sample requirements for the product involved.

2.3 Inspection

When an inspection is required and it is impractical to ship samples to the EMR Laboratory because of size or other factors, inspection may be made by EMR at an agreed upon location.

2.4 Use of Exposed Aluminum or Light Alloys

Because aluminum or light alloys may emit hot incendive sparks, when struck by rusty steel, due to thermite reactions between aluminum or light alloys and iron oxide (rust), the use of aluminum or light alloys is restricted on EMR certified equipment. Such sparks have been shown capable of igniting methane/air mixtures at one tenth the energy of similar steel-on-steel impacts. The use of aluminum or light alloy materials as internal parts of flameproof enclosures is not restricted.

The use of zinc die-cast material which resembles cast aluminum in appearance and weight, is not restricted, provided that the aluminum content is below 15 percent, and the magnesium plus titanium content does not exceed 6 percent.

In exceptional circumstances the use of aluminum is permitted where alternative non-aluminum substitutes are not available. In such cases a substantial guard made from steel other suitable materials, acceptable to EMR, may be permitted to be used. Components so protected shall also not be located in areas subject to impacts.

2.5 Certification Requirements

This section describes the Canadian Standards Association (CSA) Standards in effect for product categories covered by such standards. Where CSA Standards do not apply, the relevant Standards or requirements are cited. Also, certification agencies acceptable to EMR are described, in which case certification documents and test reports submitted in lieu of EMR tests may be acceptable.

Note: All CSA Standards and Standards from other Standards-writing organizations are available from the addresses shown in Appendix C.

2.5.1 Flameproof Equipment

2.5.1.1 General Flameproof Requirements

In order to qualify for EMR certification, flameproof equipment shall comply with the relevant requirements of the current edition of CSA Standard C22.2 No. 30 - "Explosion Proof Enclosures for use in Class I Hazardous Locations". The requirements of this standard are based on International Electrotechnical Commission (IEC) Publication 79-1 (see Appendix C).

2.5.1.2 Other Agencies

Flameproof equipment certified by agencies outside Canada will normally be deemed to comply with the relevant requirements of CSA Standard C22.2 No. 30 provided that satisfactory evidence of certification from another agency is submitted to EMR, and provided that the additional EMR requirements as specified to the applicant and herein, are met. This evidence of certification shall consist of a copy of the certificate issued, a copy of the relevant test report (if applicable), and the drawing (in duplicate) as listed on the submitted certificate. Certification documentation shall be submitted in either English or French.

2.5.1.3 Recognized Agencies

Certification agencies currently recognized by EMR are: the Canadian Standards Association (CSA), the Health and Safety Executive (U.K.), BVS (Germany), MSHA (U.S.) PTB (Germany), FM (U.S.), UL (U.S.), CHERCHAR (France), LCIE (France), "Barbara" experimental mine (Poland), MAKNII Institute (USSR), and the National research Institute for Pollution and Resources (Japan). Recognized agencies are those from whom EMR may accept test reports and/or certification documentation in lieu of testing (see clause 2.2.5.2).

2.5.1.4 North American Criteria

For those applicants who have obtained certification from North American agencies using North American Hazardous Location classifications, the minimum acceptable levels of approval for EMR certification shall include:

Class I, Division 1, Group D hazardous locations (includes methane)

and

Class II, Division 1, Group F hazardous locations (includes coal dust)

and

A temperature code rating of T4, T5, or T6 if of a heat-producing nature. In some cases a temperature code rating of T3C (160°C) will be accepted provided that evidence in the relevant test report indicates that the maximum surface temperatures obtained during testing did not exceed 150°C under worst-case conditions. The maximum allowable temperature on the surface of EMR certified apparatus referenced to 40°C ambient, under worst-case conditions, is 150°C. The area classifications stated above are explained in detail in the Canadian Electrical Code, Part I, Section 18.

2.5.1.5 European Criteria

For those applicants who have obtained certification from European agencies using European classifications, the minimum acceptable levels of approval for EMR certification shall include approval for use in Group I locations (gaseous mines) as defined by the International Electrotechnical Commission (IEC). Products approved for Group IIA, IIB, or IIC applications may be acceptable. The marking for flameproof equipment is Ex(d). Special notice should be taken that the "Increased Safety" (marking: Ex(e)) type of explosion protection is not recognized by EMR as being acceptable for certification purposes. Temperature code requirements are the same except that the North American T3C rating is not recognized in the European terminology.

2.5.2 Intrinsically Safe Equipment

All of section 2.5.1 applies to intrinsically safe equipment, except that the applicable CSA Standard is C22.2 No. 157 - "Intrinsically Safe Equipment for

use in Hazardous Locations". These requirements are based on IEC document 79-11 (see Appendix C), which relates to intrinsically safe equipment. The IEC marking for intrinsically safe mining equipment is Ex(i).

2.5.3 Conveyor Belting

Belting shall be certified in accordance with the applicable requirements of CSA Standard M422. With reference to this Standard, the applicant must request the classification of certificate required, viz. A1, A2, B1, B2, or C.

Note: At the time of printing of this document, CSA Standard M422 was a draft standard only. The reader is advised to contact EMR regarding the EMR requirements in force until M422 is finalized.

2.5.4 Flameproof Diesel Equipment

Flameproof diesel equipment shall be certified in accordance with the applicable requirements of CSA Standard M424 "Flameproof Diesel Powered Equipment for use in Gaseous Underground Mines".

Note: At the time of printing of this document, CSA Standard M424 was a draft standard only. The reader is advised to contact EMR regarding the EMR requirements in force until M424 is finalized.

2.5.5 Non-Flameproof Diesel Equipment

Non-flameproof diesel equipment is assessed only for engine emissions. Any certificates issued will state the required ventilation for the vehicle involved, an engine fuelling requirement and an altitude derating table. Ventilation assessments are made in accordance with the relevant requirements of CSA Standard M424.

Note: At the time of printing of this document CSA Standard M424 was a draft standard only. The reader is advised to contact EMR regarding the EMR requirements in force until M424 is finalized.

2.5.6 Electric Cables and Hose Conduits

2.5.6.1 Electric Cables

Electric cables are assessed in accordance with the relevant requirements of CSA Standard C22.2 No. 174, "Cables and Cable Glands for Use in Hazardous Locations".

2.5.6.2 Hose Conduits

Hose conduits are assessed in accordance with an EMR specification which is available upon request. This specification, which is a flame test almost identical to the small-scale flame test used for conveyor belting, is the only test requirement for hose conduits.

2.5.7 Ventilation Duct Materials

Note: A CSA standard for all ventilation materials is under development which, when finalized, will supersede the requirements of clauses 2.5.7.1 and 2.5.7.2.

2.5.7.1 Flexible Ventilation Duct Materials

The fire resistance of flexible mine duct materials is evaluated in accordance with the requirements of NCB (U.K. National Coal Board) Specification 285/1961 (see Appendix C). If this test proves inconclusive (due to shrinkage of the material under test away from the flame), then the ASTM D2863-70 oxygen index test apparatus, using EMR procedures, is used to evaluate the material for its fire resistance. Anti-static properties are tested in accordance with NCB Specification 158/1960.

2.5.7.2 Rigid Ventilation Duct Materials

The fire resistance of rigid ventilation duct materials is evaluated in accordance with the requirements of CSA Standard C22.2 No. 0.6, Test A. Anti-Static properties are determined in accordance with the requirements of CENELEC Standard EN50014 (see Appendix C) except that the surface electrical resistance is limited to 120 megohms by EMR.

2.5.8 Combustible Gas Detection Equipment

Combustible gas detection equipment is assessed in accordance with the relevant requirements of CSA Standard C22.2 No. 152 "Combustible Gas Detection Instruments". Section 6 of CSA Standard C22.2 No. 152 states bounce and vibration requirements for combustible gas detection instruments. Applicants should note that as EMR is not equipped to perform these tests, the applicant must provide to EMR satisfactory evidence of these tests being performed (at a site of the applicant's choosing) by provision of a test report confirming that the tests were performed, and the results obtained. EMR reserves the right to witness such testing, at the expense of the applicant.

2.5.9 Fire-Resistant Hydraulic Fluids

Fire-resistant hydraulic fluids shall be assessed in accordance with the requirements of CSA Standard M423 - "Fire-Resistant Hydraulic Fluids". The acceptance criteria is either a category 1, 2 or 3 rating, as explained in the standard.

2.5.10 Certified Repair Facilities

Repair facilities are assessed in accordance with the requirements of CSA Standard C348 - "Qualification Code for Facilities Engaged in the Repair of Electrical Equipment for Use in Hazardous Locations". One of the requirements of this Standard is that the facility have qualified personnel. To assist applicants in meeting this requirement, EMR provides a training course on an "as required" basis. It is a requirement that at least two key personnel from each facility pass this course.

2.5.11 Miners' Cap Lamps

Miners' cap lamps are assessed in accordance with an EMR specification which is available on request to EMR.

2.5.12 Blasting Machines

The present EMR requirements for blasting machines assess such units using CSA Standards C22.2 No. 30 and/or 157 as far as these documents can be applicable to blasting machines. Blasting machine characteristics not addressed in these standards are not assessed.

Note: A comprehensive standard for blasting machines is under preparation.

2.6 Types of Certification Available

2.6.1 "General" Certification

This type of certification is available for all categories of equipment and materials. All factory production is certified so long as the product meets the relevant requirements of this document, the referenced standards and the provisions of the associated EMR certificate.

2.6.1.1 "General" Certificate Categories

An EMR "General" certificate shall be assigned a status from one of the following three classifications:

Active - The EMR certificate is valid for the product, and covers existing products as well as new factory production.

Inactive - The EMR certificate is valid only for production items in existence at the time the certificate was declared by EMR to be in Inactive status. The applicant must apply to EMR to have a certificate placed on Inactive status, but later may have the certificate converted to Active at any time upon application to EMR. Such applications are treated as new certification applications if the Inactive status has existed for three years or longer. The applicant must comply with all the requirements stated herein for new applications. As such, the product is subject to reexamination, including retest and reinspection if applicable. Only two such conversions, from Inactive to Active, are permitted over the life of the certificate. When applying for conversion from Active to Inactive status, the applicant must provide a statement to EMR that no new production of the product will bear the EMR certification mark.

Cancelled - A cancelled EMR certificate (see clause 2.12) is one which is not valid, both for products in existence, as well as for any new production of the product as described on the certificate.

Note: A certificate may be Cancelled permanently or temporarily, as circumstances dictate.

2.6.1.2 Rescinded Certificates

Certificates which are rescinded will carry the "Cancelled" classification described above.

2.6.2 Label Service

Many products certified by EMR are produced in quantities too small to justify the annual factory inspections as required in the EMR Quality Assurance program (see section 2.7). The EMR label service is intended as an alternative to the "General" type of certification, to meet the needs of applicants with low production volumes. This service is only available for the product categories listed below.

2.6.2.1 Labels - General

Manufacturers will be supplied with a quantity of EMR certification labels when a product is originally certified to meet the immediate requirements of the manufacturer. Each label bears the EMR certification mark, the label serial number and the EMR certification number appropriate to the product being certified. Other information may be included at the discretion of EMR. The labels are supplied preprinted; the manufacturer's responsibility is only to affix the label to the certified product and to advise EMR of the destination of each product.

2.6.2.2 Label Type

The type of label issued will depend upon the nature of the certified equipment; relatively small items will use a plastic label, whereas large complete machine assemblies will use a stainless steel certification plate. In either case the label is supplied by EMR. EMR has been issuing stainless steel certification plates for large complete machine assemblies for some time; this label service is an expansion of that program.

2.6.2.3 Label Quantity

The quantity of labels provided upon issuance of the certification will be determined in consultation with the manufacturer, but will generally be in the quantity of one to ten labels. EMR will not supply manufacturers with a quantity of labels in excess of the immediate requirements; that is, labels will only be supplied for equipment which has been committed to a customer.

2.6.2.4 Additional Label Quantities

When additional quantities of the certified product are produced, the manufacturer must reapply to EMR for an additional supply of labels. The Quality Assurance Program (see Section 2.7) therefore does not form part of the label service.

2.6.2.5 Reexamination

EMR considers that reexamination of certified products under this program will be necessary after a maximum of ten labels have been issued for any one type of product (not including the quantity of labels issued at the time of initial

certification), or if a period of three years has elapsed after the initial certification. Large machines may be reexamined more frequently as they are normally individually tailored to suit the user's requirements. This policy will be held flexible to accommodate individual circumstances.

2.6.2.6 Reexamination Location

As is done in the case of original certifications, reexamination of certified products will be conducted at the most convenient location. In the case of large equipment, where expenses associated with the shipping of the equipment to the EMR laboratory would be greater than the inspector's travelling expenses, an EMR inspector will travel to an agreed-upon site to inspect the equipment. Small equipment may be shipped to the EMR laboratory for inspection.

2.6.2.7 Conversion to Label Service

Large mining machines already certified by EMR will be administered under the Label Service Program. Manufacturers who now have other products certified with EMR and who wish to convert their certifications(s) to the EMR label service may do so if the quantities of the certified products involved are appropriate, and if the products involved are eligible for inclusion under this service (see below). Manufacturers must apply in writing to EMR for such conversions. All subsequent production will then be handled under the label service program. Previous production of the same product already in service in the field will not be subject to this program. Once a manufacturer has converted to the label service, the following information must be supplied to EMR when applying for labels:

1) EMR certification number
2) Model number and serial number of each item;
3) Destination of the product (i.e., customer);

2.6.2.8 Administration

Either manufacturers or their Canadian agents may administer this program for the certified products involved.

2.6.2.9 Categories Included

Because it is not possible or practical to affix the above labels to some of the products which EMR certifies, the label service will only be available for the following product types:

flameproof electrical equipment;
intrinsically safe electrical equipment;
flameproof diesel equipment;
non-flameproof diesel equipment;
combustible gas detection equipment;
blasting devices.

2.6.2.10 Fees

There are no fees associated with the administration of this program. However, if a reexamination is made of a product after the initial certification, the standard EMR certification fees in effect at the time will apply, in addition to any travel and/or shipping expenses associated with reexamination(s).

2.6.2.11 Rescindment

All EMR labels remain the property of EMR. As such, EMR or its authorized agents reserve the right to remove, or cause to be removed, any EMR labels from products so labelled. Removal of an EMR label from a product invalidates the certification of the specific unit from which the label was removed, although it does not invalidate the certificate as a whole (see clause 2.6.2.14).

2.6.2.12 Transfer of Labels

The transfer of any label from the product to which it was originally assigned to any other product is not permitted.

2.6.2.13 Validity of Label

When a product is placed on the EMR Label Service, only those products which bear the EMR labels will be considered certified. Labelled products will be shown in a special section of the EMR List of Certified Products.

2.6.2.14 Label Service Certification Categories

An EMR Certificate which is issued under the label service shall be assigned a status as follows. The following categories are normally individually assigned to each labelled item listed on the schedule(s) associated with the certificate. However, a certificate as a whole, including all the items listed on all schedules, may be cancelled for cause (see clause 2.12).

Active - The EMR certification is valid for the product bearing the assigned EMR label.

Cancelled - The EMR certification is not valid for the product normally hearing the assigned EMR label (see clause 2.6.2.11)

Note: This program provides an alternative to the EMR Quality Assurance program, which is geared to higher production volumes of certified products. It is anticipated that the benefits of the EMR label service will be:

1) reduced cost to manufacturers (or their agents) for low production volume items;
2) better monitoring by EMR of the status of manufacturers of low volume items and the products they manufacture;
3) a reduction in the number of unnecessary factory inspections associated with the Quality Assurance program.

2.7 Quality Assurance Program

2.7.1 Applicability

This section applies only to "General" type certificates having an Active classification (see above). Other types and classifications of EMR certificates (i.e., Inactive, Cancelled and Label Service) are not subject to the requirements of the EMR Quality Assurance Program. The fees associated with this program are specified in Appendix A.

2.7.2 Quality Assurance Inspections

The applicant agrees to permit EMR or its authorized representative to conduct inspections for the purpose of verifying continued compliance with the products specifications as listed on the certificate. Such inspections shall be

made at the maximum rate of two per year, and will normally be unannounced unless special arrangements are made. EMR reserves the right to obtain samples of the certified product for testing.

Note: In order to reduce the expense of this service, arrangements have been made with the Canadian Standards Association (CSA) for their inspectors or their agents to perform some of the factory inspections on behalf of EMR. This will be of special interest to companies holding CSA Certification(s) as the same inspector may be able to perform both inspections during one visit.

2.7.3 Rate of Inspections

The actual frequency with which quality assurance inspections are made will depend upon the following factors:

1) the opinion of EMR as to the overall quality of the product produced, and the type of product;
2) the opinion of EMR as to the overall capabilities of the manufacturing facility insofar as quality assurance is concerned;
3) whether or not the manufacturer has implemented a product quality management program in accordance with the Z299 series of Standards published by CSA. The implementation of these Standards is recommended by EMR but is not considered to be mandatory.

2.8 Product Conformance

The applicant agrees to manufacture, or be responsible for the manufacture of, the certified product in conformance with the specifications for the product as stated in the certificate. The applicant agrees to advise EMR in writing of any changes to the certified product which would result in additions, deletions, or other changes to the product specifications as listed in the relevant certificate prior to the shipping of such products to customers.

2.9 Machine Assembly Certification

EMR will undertake to certify complete machine assemblies, which usually will employ several different categories of certified products, as well as components not within the scope of this certification service. All machine assembly certifications will be administered under the Label Service, (see Section 2.6.2).

Note: Complete machine assemblies may include road heading machines, tunnel boring machines, roof bolters, engine power packs to be used on a variety of vehicles, load-haul-dump electric and diesel powered machines, personnel carriers, electrically-driven hydraulic power packs, drilling machines, and other products as deemed appropriate by EMR.

2.9.1 Application Procedures

The procedures for individual component certification and complete machine assembly certification are identical, except that:

1) only one application need be made for a complete machine assembly regardless of the number of products on the assembly to be investigated by EMR;
2) marking requirements differ (see Section 2.13.3).

2.9.2 Documentation Required

Applications for complete machine assembly certifications do not in any way diminish the documentation requirements for each certifiable component of the assembly.

2.9.3 Machine Assembly Components

Components of complete machine assemblies which have been investigated and found suitable for certification by EMR as part of the complete machine assembly are not considered to be certified by EMR for any use other than as part of the certified machine assembly. A separate application must be made to EMR for individual certification, if desired, of such machine components.

2.9.4 Requirement for Machine Assembly Certification

The requirement for any machine assembly to be certified rests with the authority having jurisdiction. In addition, such machine assemblies must be deemed by EMR to be within the scope of the EMR certification service.

2.10 Certification of a Range of Products

EMR, at its discretion, will undertake to certify a range of products having similar characteristics, such as a range of conveyor belting or a range of electric motors (see clause 2.2.6.7).

2.11 Scope of Certificate

No inference shall be made as a result of the issuance of any EMR certificate that products so certified comply with any criteria, stated or implied, which are not specifically cited therein.

2.12 Rescindment of Certificates

2.12.1 Right of EMR to Rescind

EMR reserves the right to rescind (see clause 2.6.1.2) or reinstate, for cause, at any time, any certificate.

2.12.2 Removal of Certification Mark

EMR or its authorized representative reserves the right to remove the EMR certification mark from products as part of the rescindment procedure.

2.12.3 Right of Applicant to Rescind

EMR certificate holders reserve the right to cause their EMR certificates to be rescinded at any time by notification of same to EMR in writing.

2.12.4 Identification

Products not identified with the marking as specified in clause 2.13 shall not be considered to be EMR certified products.

2.13 Marking Requirements

2.13.1 Certification Mark

Each certified product shall be identified with the EMR certification mark in any reasonable size, and/or the certification number, as shown in Figure 1, and as indicated in the following clauses. Certified products administered under the Label Service comply with the marking requirements so long as the label(s) supplied by EMR is/are affixed to the product(s). Certified products administered under a "General" certificate shall be durably marked with materials and methods supplied by the applicant but the method of marking used shall be acceptable to EMR. The materials for marking may include adhesive-backed plastic, embossing, direct printing, non-aluminum metal labels, or

other means acceptable to EMR. The EMR marking will be permitted to be incorporated with a larger label containing other information the applicant deems appropriate for inclusion on the label.

2.13.2 Marking - Conveyor Belting

Conveyor belting must be marked in accordance with the requirements of CSA Standard M422. In addition, the belting must carry the EMR logo (see Fig. 1) and the certificate number in the same size, depth of impression and frequency as specified in the M422 Standard.

2.13.3 Marking - Complete Machine Assemblies

Products certified as complete machine assemblies shall be identified by a metal label supplied by EMR bearing the certification mark as described in Fig. 1, but the individual certified components of the assembly need not be marked. All complete machine assemblies are required to be administered under the Label Service (see Section 2.6.2).

2.13.4 Marking - Cables, Cable Glands and Hose Conduits

Cables and cable glands shall be marked in accordance with the requirements of CSA Standard C22.2 No. 174. In addition, cables and cable glands shall be marked with the letters EMR followed by the applicable EMR certification number. Hose conduits shall be considered as cables with non-metallic jackets for the purposes of marking, and shall be marked accordingly.

2.13.5 Marking - Flexible and Rigid Ducts and Pipes

The products covered by this section shall be marked as indicated in Fig. 1, with a frequency of one marking per linear metre of flexible mine duct ventilation material or one marking per linear metre of rigid duct material.

2.13.6 Marking - Fire-Resistant Hydraulic Fluids

Each original package containing the EMR certified fire-resistant hydraulic fluid shall bear the EMR certification markings as shown in Fig. 1.

2.14 Certificates and List of Certified Products

EMR publishes, on an annual basis, a list of certified products. Copies of individual certificates are also available if the certificates involved do not contain confidential information.

3. NON-CERTIFICATION AND CONTRACT TESTING SERVICE

3.1 Description of Service

EMR provides a non-certification contract testing service encompassing all the product categories in the certification service. In addition, other categories of equipment for use in hazardous locations such as gas fired equipment, flame arresters, and explosion protection devices for applications in offshore oil platforms, natural gas compressor stations and petrochemical plants have been assessed.

3.2 Tests Performed

In all cases, a mutually acceptable test program for the product involved will be established and the output of the investigation will be a test report documenting the procedures followed and results obtained. All testing and reports are considered to be confidential and will only be released to other parties with the written consent of the applicant or in response to lawful demands.

3.3 Fees

Testing fees will be charged as detailed in Appendix A, but the cost of special test apparatus, fixtures and consumables required for such testing services are additional and are the responsibility of the applicant.

3.4 Scope

In general the scope of non-certification contract testing services provided by EMR parallels those provided within the certification service but applicants will not be subject to any of the terms and conditions associated with certification.

APPENDIX A

A.1

The following fees apply to certification and contract testing services. These fees are subject to periodic revision, and applicants are advised to contact EMR regarding updates to this schedule. Any travelling and living expenses associated with inspection of products as part of any certification investigation are additional to the fees described below.

A.2 FLAMEPROOF AND INTRINSIC SAFETY

Examination of drawings and specifications	$184.50
Inspection of prototype	184.50
Explosion tests:	
standard tests	275.50
special tests	551.50
Overpressure tests:	
small device (less than 25 liter internal vol.)	122.50
large device (more than 25 liter internal vol.)	183.50
Intrinsic safety tests	183.50

A.2.1

The explosion test fees described above are charged per enclosure. Samples which comprise more than one flameproof enclosure and which require separate explosion tests of each enclosure will be charged the above fees on a per enclosure basis.

A.3 CONVEYOR BELTING

Flame test	$260.50
Drum friction test	521.50
Static conductive tests	61.00
Propane burner test	489.00
Oxygen index test	122.50
Hot plate ignition test	317.50

A.4 ELECTRICAL CABLES

Flame test - horizontal	337.00
Flame test - vertical	107.50

A.5 COMBUSTIBLE GAS DETECTION DEVICES

Each new device (all tests)	918.00
Retest after failure in one category or modified device	459.00

A.6 DIESEL EMISSION

Review of drawings and specifications	840.00
Field examination of equipment	692.00
Field particulate emissions tests	1461.00
Laboratory emissions tests (gaseous and particulate)	6091.00
Calculation of ventilation from emissions data	1681.00

A.7 MINE DUCT MATERIAL

Flame test	184.00
Static conductivity test	61.00

A.8 FIRE-RESISTANT HYDRAULIC FLUIDS

Wick flame test	214.50
Spray ignition test	275.50
Fluid stability test	107.50
Fluid conditioning test	214.00

A.9 QUALITY ASSURANCE PROGRAM

A fee will be charged to manufacturers or their agents who are subject to the requirements of the Quality Assurance Program in an amount not to exceed $500.00 for the 1985 - 1986 fiscal year. This fee is charged annually, to cover the cost of the inspections conducted on a routine basis. If a special follow-up inspection based on the findings of the routine inspection is required, all expenses associated with the follow-up inspection shall be the responsibility of the manufacturer or agent inspected.

A.10 BILLING

At the conclusion of all testing and issuance of the certificate and/or test report, as applicable, the applicant will receive a notification of the total fees associated with the project. At a later time the applicant will receive an invoice from the EMR accounting office in the same amount as stated in the notification sent previously. Applicants are advised not to remit any funds until the invoice, which contains payment instructions, has been received. All fees are payable in Canadian funds. Fees associated with the Quality Assurance Program will be billed to the applicant either by EMR or CSA depending upon which organization performed the service. Failure to pay any fees associated with any EMR certification and/or contract testing program will result in automatic rescindment of certification, if applicable, followed by legal action.

APPENDIX B

From the Ottawa International Airport, the directions to the CANMET Bells Corners are as follows.

1) From the Airport, follow the Airport Parkway signs to downtown Ottawa. The Airport Parkway name will change to Bronson Avenue as the traveller approaches the city.
2) From Bronson Avenue, take the Queensway (also known as highway 417) West. This entrance to the Queensway is marked with signs.
3) Follow the Queensway West (about 11 km) and take the Moodie Drive exit, and turn South on Moodie drive (Moodie Drive South direction is marked with a sign).
4) Follow Moodie Drive about 1 km, and just after going underneath an elevated railway track, turn right on Timm Road.
5) Proceed along Timm Road until the large "CANMET - Bells Corners Complex" sign is reached. Report to the Guardhouse. The Canadian Explosive Atmospheres Laboratory is located in Building No. 9.

Note: Hotel accommodations are available in the nearby community of Bells Corners, which is part of the city of Nepean, Ontario.

If approaching Ottawa from the West while on highway 417, the instructions are as follows.

1) Take the Eagleson Road exit, and turn south on Eagleson Road.
2) Proceed along Eagleson and turn left on to Timm Road which will be encountered after the first set of traffic lights on Eagleson Road.
3) Proceed along Timm Road until the large CANMET - Bells Corners sign is reached. Report to the Guardhouse. The Canadian Explosive Atmospheres Laboratory is located in Building No. 9.

APPENDIX C

The Standards mentioned in this document may be obtained as follows. A fee is charged for all Standards.

Canadian Standards Association telephone (416) 747-4000
Standards Sales Division
178 Rexdale Boulevard
Rexdale, Ontario
M9W 1R3

International Electrotechnical Commission
3, rue de Varembe
Geneva, Switzerland

National Coal Board
Mining Research and Development Establishment
Ashby Road, Stanhope Bretby
Nr Burton-On-Trent
Staffordshire, England

As an alternative, users of standards who require information concerning the scope, availability, point of sale and current status of Canadian, foreign and international standards can communicate with the Standards Council of Canada as follows. The service is free of charge.

Telephone: A) Toll free from anywhere in Canada: 1 (800) 267-8220
B) From outside Canada: (613) 238-3222

Telex: 053-4403

Mail: Standard Council of Canada
Standards Information Service
350 Sparks Street
Ottawa, Ontario
K1R 7S8
Canada

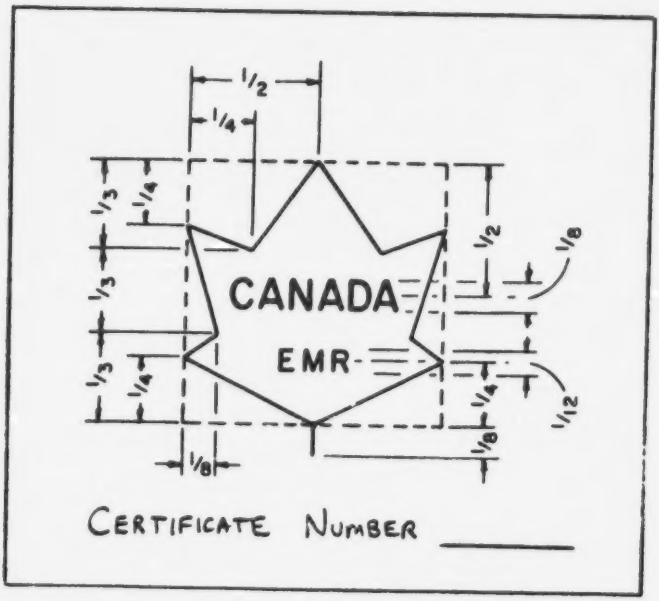

Fig. 1 - EMR certification mark

Fig. 1 - EMR certification mark